

Attributing responsibility for energy justice: A case study of the Hinkley Point Nuclear Complex

Kirsten Jenkins^{1*}, Darren McCauley² and Charles Warren²

¹Science Policy Research Unit, University of Sussex, UK

²School of Geography and Sustainable Development, University of St Andrews, UK

*Corresponding author, Centre on Innovation and Energy Demand, University of Sussex, Jubilee Building, Room 367, Falmer, East Sussex, BN1 9SL, k.e.jenkins@sussex.ac.uk

Abstract: Since 2006, as part of the transition to low-carbon technologies, UK energy policy has moved towards incentivising new nuclear power production. As a result, the UK has developed a (now delayed) strategy to deliver around 16 GW of new nuclear power by 2030. This policy context provides an opportunity to reflect not only on the material infrastructure needed to meet transition targets, but also on who is responsible for the energy justice implications of these decisions. Using data collected from 26 semi-structured interviews with NGO and policy representatives, this paper presents a case study of energy justice concerns surrounding the Hinkley Point Nuclear Complex in Somerset, focusing particularly on the highly controversial Hinkley Point C developments. The results emphasise the importance of considering not only instances of energy justice or injustice, but of attributing responsibility for them, a concept that has been largely overlooked in the energy justice literature. NGOs, government and business allocate responsibility differently in nuclear energy decision-making. We find that perceptions of responsibility are highly dependent upon the level of transparency in decision-making.

Key words: Energy justice; responsibility; energy policy; Hinkley Point; nuclear energy

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1. Introduction

Since 2006, United Kingdom (UK) energy policy has moved towards incentivising new nuclear power production, proposing the first new reactor since the construction of Sizewell B in 1986. This policy reversion is partly a response for a shift towards low-carbon technologies (Florini and Sovacool 2009; DECC 2011a,b; Watson and Scott 2009), and partly a response to a projected energy gap caused by existing facilities coming to the end of their operational lifespans. Planned decommissioning means that by 2020 the UK's total nuclear capacity will have reduced by around three quarters (BERR 2008; Bickerstaff *et al.* 2008). Even with lifetime extensions on some existing facilities, new energy production infrastructure will be required. As a result, the UK has developed a (now delayed) strategy to deliver around 16 GW of new nuclear by 2030, with proposed facilities at Hinkley Point, Bradwell, Sizewell, Wylfa, Oldbury and Moorside (BIS 2013). The Moorside facility is in difficulty as Toshiba's nuclear unit Westinghouse files for bankruptcy; Hitachi at Wylfa have expressed serious concerns about the financing of their new reactor and as is outlined below, Hinkley Point is heavily delayed and over cost. Nonetheless, the UK's change in attitude to nuclear power provides an opportunity to reflect not only on what material infrastructure is needed to fulfil policy goals, but also on who is responsible for the energy justice implications that these decisions carry.

In a definition provided by Jenkins *et al.* (2016a), the energy justice concept exists to evaluate (a) where injustices emerge, (b) which affected sections of society are ignored, and (c) which processes exist for their remediation in order to reveal and reduce such injustices. The emphasis to date has been on identifying who is ignored and, as a consequence, on identifying

strategies for remediation (McCauley et al., 2016). The literature on energy justice has focused on the fuel poor (Middlemiss and Gillard 2015; Chard and Walker 2016; Hiteva 2013; Sovacool 2015; Teller-Elsberg *et al.* 2016; Walker and Day 2012), on disabled or unwell members of society (Snell *et al.* 2015; Liddell *et al.* 2016), on poor and ethnic communities who historically shouldered the burden of toxic waste dumps (Williams 1999; Davis 2009; Reames 2016) and on anti-wind campaigners (Jenkins *et al.* 2016a), amongst others. This paper investigates the question of “justice by whom?”, using a case study approach to identify who in the case of UK nuclear energy developments is perceived to be responsible for tackling energy justice concerns.

The paper begins with an introduction to the energy justice concept and tenets, and an exploration of the questions “justice for whom” and “justice by whom”, articulating a conceptual call to expand the energy justice literature to consider notions of responsibility. The next section provides the research design, explaining why we focus on Hinkley Point as our case study, and the data collection and analysis methods used. The paper then presents and discusses the results, reflecting on the implications of dispersed and centralised models of responsibility which emerge from the research interviews. We make the case for increased transparency in nuclear energy decision-making in order to allow more sophisticated understandings of responsibility to emerge. The final section on policy implications calls for a more systematic inclusion of responsibility into ethics and justice explorations in relation to energy decision-making more broadly, and reflects on the need to learn from lessons from the Hinkley case.

2. Energy justice and Responsibility

According to McCauley *et al.* (2013: 1) energy justice seeks “to provide all individuals, across all areas, with safe, affordable and sustainable energy”. It is concerned with principles of equity and fairness in energy-related decision-making and infrastructural development, and is guided by a normative aim to reduce injustice. McCauley *et al.* (2013, 2016) and Jenkins *et al.* (2016a) use three core tenets to operationalise this aim: distributional justice, procedural justice and justice as recognition. In their work, distributional justice refers to the unequal distribution of environmental benefits and ills and their associated responsibilities; procedural justice highlights the importance of procedure in influencing whether outcomes for stakeholders are equitable or inequitable; and justice as recognition encapsulates the aspiration for individuals to be fairly represented, to be free from physical threats, and to be offered complete and equal political rights. Other frameworks, such as the work of Heffron *et al.* (2016) and Sovacool *et al.* (2016), include cosmopolitanism as an additional tenet. Table 1 provides a summary of the implications of the tenet approach when examined across the evaluative and normative contributions.

INSERT TABLE 1 HERE

This paper seeks to add to this literature by focusing on the notion of responsibility. We position this within the context of the justice as recognition tenet. For some authors, the focus is almost exclusively on matters of distribution (Vincent 1998; Dobson 1998), whereas for others justice as recognition is acknowledged, but only as a tacitly included element in the ideal definition of distribution and/or participation (Schlosberg 2004); Fraser (1999:

98) highlights that some perceive it to be a “false consciousness”, and a hindrance to the pursuit of social justice. However, following both Fraser (1999, 2001, 2009, 2014) and Young (2011), and in keeping with McCauley *et al.* (2013), this paper affirms justice as recognition as the third tenet and argues that it provides a key role in identifying not only who is affected by energy justice, but also who is *responsible* for that justice.

The energy justice literature has not fully explored who is responsible for energy justice and/or its remediation. This is an aspect of justice that is prominent in environmental and climate justice debates (see Bulkeley *et al.* 2013, 2014; Barrett 2013, 2014), and was thrust to prominence by the works of Iris Young (2004; 2006; 2008; 2010; 2011). In the environmental justice literature responsibility is acknowledged as a key principle, particularly in relation to future generations (Reese and Jacob 2015; Syme *et al.* 2014; and Grineski *et al.* 2012). In this context, both Reese and Jacob (2015) and Syme *et al.* (2014) note that justice appraisals represent a moral basis of behaviour for environmental protection. The same is true of the climate justice movement, where “common but differentiated responsibilities” underpin international negotiations (Shaw 2016: 512; UNFCCC 1992) and represent a key theme in the literature. In both cases, recognising the needs or existence of particular groups is entangled with a need to identify who is responsible for enacting just actions towards them. This paper expands this exploration into the energy justice literature and argues for a focus not only on questions of “justice for whom?”, as is typically the case, but also on “justice *by* whom?”.

Sovacool *et al.* (2016: 1) offer one approach to responsibility within energy justice literature when they state that “an important dimension to justice

goes beyond concepts and analysis to decisions and thus decision-making, including policy-makers and regulators ordinary students, jurists, homeowners, businesspersons, investors, and consumers". Heffron and McCauley (2017) refer to this approach as placing responsibility as a key applied principle for enacting energy justice. This approach highlights that we *all* bear the burden of creating energy justice, even when we make the most mundane energy choices such as turning on a light switch. This also builds upon Young (2011) who points to the dispersion of responsibility throughout society compared with previously individualised incarnations which focused only on the family unit. However, these statements do not engage with the power differentials in each group, their awareness of the challenges, or their range of capabilities.

We argue that if the purposes of energy justice are to serve as an analytical tool and move beyond academic discourse, as has been suggested by Heffron *et al.* (2015), Sovacool and Dworkin (2015), Sovacool *et al.* (2014) and Jenkins *et al.* (2016b), then in the context of this discussion it must sufficiently "politicise" its focus to avoid naivety in expecting responsibility where it is not in practice assumed. Indeed, we recognise in line with Young (2011) that if structural injustices are to be tackled, models of responsibility must transition from an individualised family-based focus to collective cosmopolitan incarnations where individuals recognise their connections beyond their immediate family setting. Thus, this research focuses on understanding when groups are perceived to be responsible for and are capable of directly tackling energy injustices. We present below the interpretations of NGOs, companies, and government towards responsibility. Before analysing the results, we outline our methodological approach. We note here that there is insufficient space to cover

the background of nuclear policy or ethical issues of nuclear in general. Although we concentrate on the Hinkley Point complex, we use this only as an initial exploratory case study and as a lens to explore this issue.

3. Research Design

This section outlines the key components of the research design. We provide, firstly, some key background information on the case study, Hinkley Point, in order to give context to our findings; Hinkley Point was the case study where the issue of responsibility arose the most in our interview data. The mechanism for research data collection and analysis is then detailed before covering the results in the next section.

3.1 Case Selection: The Hinkley Point Nuclear Complex

The Hinkley Point Complex in the West Somerset District of the County of Somerset, South West England, comprises two reactor facilities: Hinkley Point A, which is undergoing decommissioning, and the currently operational Hinkley Point B. Both sites are adjacent to the building works for the first of the UK's proposed new reactors, Hinkley Point C. The first public inquiry into the construction of Hinkley Point C took place between 1988 and 1989. However, under consideration at the same time as the “dash for gas”, and suffering unfavourable economics following the privatisation of the electricity sector, a new reactor was never constructed (Johnstone 2014). Yet despite this initial failure, the Government White Paper “The Energy Challenge: Energy Review Report 2006” (DTI 2006) rekindled the concept.

Through a Strategic Site Assessment process in 2008, 11 potential areas for new reactors were identified, three on green-field sites and eight at the location of pre-existing facilities (Thomas 2016). During this process, Hinkley Point was put forward as a potential site by EDF, and following extensive consultation was selected in 2013 (EA 2013). EDF's rationale for the site selection was that there had been a nuclear power station operating at Hinkley Point since 1965, and consequently that the local community was familiar with the technology and the employment opportunities it can offer (EDF 2009a). The initial public engagement around the facility had taken place both as local and national consultations (Johnstone 2014). Taylor (2016: 166) notes that in contrast to the initial opposition against the facility in the 1980s, "the prospect of a new nuclear power station attracted only muted criticism, mainly in respect of the construction works and new transmission cables".

Plans for the site include the construction of two European Pressure Reactors (EPRs – also known as Evolutionary Power Reactors) and associated facilities, which a 2006 White Paper initially expected would come online by 2023 and be operated by a multinational consortium led by EDF (DTI 2006; EDF 2009b; Černoch and Zapletalová 2015). The preparations for Hinkley Point C began in 2014 (Černoch and Zapletalová 2015), sparking fresh debate about the necessity and environmental and social implications of nuclear power. Indeed, the Hinkley Point C project has faced critiques including, but not limited to, concern over state-aid inquiries, the formation of a finance consortium or lack thereof, loan guarantees, the collapse and refinancing of Areva, and reactor vessel design faults following issues in the construction of a sister facility – the Flamanville reactor in France (Thomas 2016). Nuttall and Earp (2014) add that

further hindrances included the global financial crisis of 2008 and 2009 and the Fukushima Daiichi accident in Japan in 2011. Despite extensive ground preparation and the commencement of construction work, there is currently no indication of when construction might be completed, and the project is running behind time and over cost.

3.2 Data Collection and Analysis

This research used interviews as the core method, in line with other studies on nuclear new build (see Heffron 2013; Jasper 1990; Hecht 1998, 2009, RAE 2010) and nuclear energy policy (Stoler 1985, Morone and Woodhouse 1989, Perin 2005, Rehner and McCauley 2016). The sample of interview participants comprised members of the NGO and policy elite, reflecting the study's primary focus on energy justice as a mode of policy critique. Elites are recognised as groups or individuals holding comparatively more power, privilege and political influence than lay populations. Respondents were both elite and expert. We sampled representatives from the most prominent NGO and policy groups engaged with the research case study.

For the purposes of this work, NGOs are defined in line with Lewis (2014: 3) as "third sector" not-for-profit organisations concerned with addressing problems of global poverty and social justice'. Lewis identifies that these groups are normally linked with the concept of charity, while others give them more political motivations as "civil society organisations", groups of organised citizens independent from the government or business sectors. This distinction justifies their treatment as a separate sample group from policy respondents. Policy

respondents comprise a grouping of elite participants from industry, government, regulators and academia.

Data were obtained via 26 semi-structured, oral history interviews, taking place between 1st November 2014 and 1st January 2016. Interview questions were constructed in the light of the preliminary readings, the research rationale, and the research question. Participants were sampled through direct snowballing, where individuals were contacted directly and, either following interview or a decline to participate, were asked to recommend other appropriate participants (Lewis-Beck *et al.* 2004). During the snowballing process 56 individuals and organisations were contacted with invitations to participate in the research. Those who did not participate cited a range of reasons, including unavailability and conflicts of interest.

Our aim was to provide a robust account of the contours of extant discourses (McDonald 2013). We recognised that this approach tends to generate perspectives similar to those of the person recommending other interviewees. However, given the sensitive nature of the nuclear industry and organisations involved, this was determined to be the best means of accessing interviews. The views of participants are not taken to represent their associated organisations or peers, and to protect the identities of the respondents all names and positions have been removed and the attributions randomised. Appendix 1 is a list of organisations used in this research, in a randomised order.

The themes presented in the results section below were derived from both top-down coding based on the research questions and literature, and bottom-up coding derived from the interview transcripts, an approach similar to that used by Heffron (2013). Once transcribed and collated the interview

transcripts were systematically coded and analysed using NVivo. Following Thomas and Harden (2008: 8), the process comprised three stages, (1) the free line-by-line coding of data sources, (2) the organisation of these “free codes” into “descriptive” themes, and (3) the development of “analytical” themes, which form the basis of the results presented. More specifically, during the first phase of top-down coding using NVivo, excerpts, quotations and passages were coded into themes conforming to the interview question framework, focussing on distributional justice, justice as recognition and procedural justice. Following explorations of similarities and differences between the emergent codes, new group codes were then created that captured the meanings of information within them. The themes represent common threads of discussion and topics of concern raised by the interview participants. This bottom-up process allowed identification of new details from the interviews.

The quotes presented in the results section have been selected as indicative representations of the discussions within the theme of responsibility. We note here that our aim is not to substantiate the truth of the information contained within these quotes, but to accurately and impartially report on interviewee discourses and their perceptions of energy justice. Given that developments are changing so rapidly around the proposed Hinkley Point C, this research takes 1st January 2016 as a cut-off point.

4. Results

We now focus on the main results of this investigation: interviewee answers to the question “justice by whom?”. Across the two sample groups, NGO and policy, there was recognition that although all actors play some role in the provision of

energy justice, industry and policy bodies carry the majority of the responsibility for the justice concerns raised by interviewees. Illustrative examples are provided in the following paragraphs. The results reflect both evaluative and normative examinations as respondents were asked to describe (1) who *is* responsible (evaluative) and (2) who *ought to be* responsible (normative). Within their answers respondents reflected both on their own responsibilities and on those of others, acknowledging therefore that all groups represented in this research study are involved in both the production and continuation of energy justice.

4.1 NGO perceptions of responsibility

We begin with an assessment of NGO respondents' responses to the question "who is responsible for the provision of energy justice in the case of Hinkley Point?". From both an evaluative and normative perspective, interviewees allocated most of the responsibility to the government, as well as to other policy organisations. In comparison to non-NGO organisations, there was an evident lack of self-reflection. An anti-nuclear campaigner (interview 7) reflected on the responsibility of external industry and policy groups, representing a focus on "people at the top". For that respondent this included EDF workers, the now defunct government Department for Energy and Climate Change (DECC), the Office for Nuclear Regulation (ONR), and the Chancellor of the Exchequer. The interviewee expressed the view that these groups and individuals should be questioning whether investing in Hinkley Point C is sensible or not, and was adamant that it was not. Government oversight was not in the interviewee's

opinion being performed well. These types of view were consistent across the NGO community.

Restating the importance of the DECC and the ONR in decision-making around Hinkley Point, a separate NGO respondent (interview 13), not only highlighted the influential role of government employees, but questioned their suitability for having a consultative role at all. They noted in particular that when their organisation attended DECC and ONR meetings, a large contingent of the DECC representatives appeared to be “recent graduates from Oxford and Cambridge”. Given their apparent youth, the respondent believed that they lacked historical awareness and experience – including knowledge of the 1988 Hinkley Point C inquiry and the 1976 Flowers Report. In their view, without a working oral history and information being passed on, they believed that the representatives were not able to adequately address the questions that they were being asked. Thus, despite their apparent authority and responsibility in enacting just outcomes, they were unable to fulfil their role.

There was also a feeling among NGO respondents that questions around responsibility were made more complex by a severe lack of transparency. A member (interview 3) of an anti-nuclear campaign group highlighted the difficulty of identifying who was ultimately responsible:

“You cannot say who, because we have structured our society in ways and we have put procedures in place that perpetuate this and all the other stuff that we are getting completely wrong”.

The interviewee concluded that whilst the government might be described as being ultimately responsible, the government is hard to define, is constantly evolving, and as the respondent articulated above, may be ineffective. Thus, the opaque myriad of decision makers hid who was currently responsible. They also added that “companies come and go and EDF probably would not exist in 150 years” (interview 3). This discussion pointed towards a *long-term* focus on government, rather than on companies. Private businesses were looked upon as temporarily involved in profit making without having a long-term buy-in to any consequences. Government was therefore positioned as the actor who “should” be responsible, even if the definition of it was elusive.

In addition to the predominant focus on government, there were also some instances where self-reflection was evident. NGO respondents also discussed their own on-going responsibility given their assumed role in commenting on operations at the Hinkley Point site. An NGO member stated that part of what makes her continue to work on the nuclear issue was her own sense of responsibility to both wider society and “to her children and as yet unborn grandchildren” (interview 9). Further, a different respondent (interview 4) pointed out that, historically, NGOs were paid to make such contributions, raising the example of when Greenpeace was employed during the 1988 inquiry. Building the case for the role of NGOs further, another respondent (interview 2) drew on personal experiences of the latest Hinkley Point inquiry which gave them the impression that:

“(T)he people who were making the decisions were relying on groups like us, and other NGOs presumably, to point things out to them so that they could investigate it a bit further”.

However, the respondent did reflect negatively on whether that was appropriate, commenting that at the time they thought;

“Wow, this is worrying because I have only been involved with this for a little time and they are actually going to look at what my comments are to decide on what they are looking at”.

Here, where responsibility was given it was received somewhat uncomfortably.

4.2 Non-NGO perceptions on responsibility

Policy groups were also asked to explicitly attribute responsibility for the enactment of energy justice. The data pointed towards a similar observation to that found in the NGO interviews. The government, companies and regulators are the primary subjects of responsibility – and indeed they were aware of this. This meant that self-reflection was more evident among non-NGO groups. They differed from the NGO interpretations, however, with regards to the perceived lack of transparency and the long-term responsibility held by government. One respondent (interview 15) suggested that since the privatisation of the energy sector the responsibility for energy justice has been “shared between the industry and the government”. This is based on the ideas that, firstly, the industry wants to make money from new developments, therefore it is in their

interests to ensure that they can do so, and secondly, that the government wants to ensure continuity of supply for its citizens. Responsibility was attributed to regulators and site developers as an outcome of government procedures.

A more nuanced sense of responsibility is evident in so far as each of the policy actors – government, business and regulators – all have different types of responsibility which drives a sense of due process. A representative (interview 16) from an energy company stated, for example, that following the reviews on their planning application they must prove an understanding of all issues and undertake appropriate checks. In this regard it was their responsibility to ensure due process with oversight from government bodies. The responsibility of a company is, from the interviewee (16) perspective, to complete all due diligence, whilst the regulator is there to ensure compliance, leaving government to oversee “the bigger picture”.

From a government standpoint, interview data pointed towards a sense of broader responsibility – fitting in with the interpretation presented above. Companies and regulators fulfilled legal obligations, whilst the government took responsibility for the overall energy policy landscape and thereby the justice implications of broader energy decisions. One national government representative (interview 25) identified that his overall responsibility was to “provide energy to the national population”, who he believed were primarily “concerned with affordable prices”. He then outlined government’s responsibility to assist business and industry as (1) “they were reliant on large quantities of base-load energy” and (2) the nuclear industry and associated wider industry groups themselves “created and sustained a broad spectrum of jobs and careers” that could materialise – in this case – as a new fleet of nuclear power stations. In

this regard, the results demonstrated a sense of dual responsibility to both the citizen and to business. Responsibility for policy elite actors is therefore understood to be a sophisticated process of checks and balances.

Some respondents (interview 20, 25) did refer to a “checks and balances” approach as encouraging a “minimal compliance” mind-set, giving a less positive overview of the drivers of due process. In addition, another policy interview (17) revealed that, from their perspective:

“If you are EON or RWE or EDF, you are looking to fulfil what you are obliged to do at the minimum cost to yourself. You should not be surprised when that happens. Their shareholders would be very upset if they were acting with a social conscience. It is not their fiduciary duty to have social consciences and spend shareholders’ money on that”.

Policy interviews have therefore revealed a nuanced triple lock (business – regulator - government) approach to responsibility, which is perhaps designed to ensure (only) minimal sense of energy justice. This nuanced approach to responsibility is also apparent from a representative from a local District Council (interview 22). The interviewee gave attention to not only policy groups at the national level, but at the local level too as they discussed the responsibility of local councillors and MPs to serve as a conduit for information provision. It was suggested as an illustration that the role of the Parish Council was to guide local groups, “let them digest the information and with time, develop their own opinions”. The interviewee also identified complexities in the jurisdiction of local bodies, as in this case most developments were considered by Sedgemoor

District Council despite the fact that the station itself is in West Somerset. This resulted in difficulties in establishing exactly where “local responsibility” lies.

In summary, notions of responsibility are explicitly held by both NGOs and policy elites. This includes, in most instances, responsibility held by government, regulators and companies, but the results uncover some notable differences. NGOs allocate current responsibility to government and companies, whilst placing a significantly higher focus on government over the long-term. Policy elite actors allocate responsibility to a complex system of multi-level checks and balances in decision-making. We discuss the implications of these findings in the next section.

5. Discussion

Articulations of “justice *by whom?*” emphasised that for both NGOs and non-NGOs, government, regulators and industry hold a greater degree of responsibility for the provision of energy justice than other actors in the nuclear energy system. This finding contrasts with the social connection model of Young (2011), which states that all those who contribute by their actions to structural processes with some unjust outcomes share responsibility for the injustice, and suggests that “structural injustices” remain within nuclear energy policy. Transparency emerges in our study as a key determining factor in how responsibility is allocated. Indeed, in her earlier work, Young alludes to the importance of “increasing (the) transparency of connections” as means to deconstructing structural injustices (Young, 2004: : 388). This finding carries implications for future energy policy and industry strategy, as society considers not only the need for new, often low-carbon, infrastructure, but also for long-

term, socially-sensitive energy developments. We argue that nuanced multi-scalar and multi-actor systems are more achievable when there is a heightened level of transparency in decision-making, and an acknowledged common responsibility for potential injustices.

5.1 Dispersed versus centralised notions of responsibility

Interview respondents in our study reflected both on their own responsibilities and on the responsibility of others to varying degrees, acknowledging that all groups represented – NGOs and policy elites – are involved in both the production and continuation of energy justice. This reinforces the argument of Sovacool *et al.* (2014: 199) that as each of us participate in the global energy system each of us contributes to energy injustices, because the decisions that we make about which electricity company to patronise, for example, have moral and ethical implications. Furthering this statement, Sovacool *et al.* (2016: 5) later add that contemporary analysts, policymakers and even consumers should reconsider their energy decisions as not only technical, economic or even environmental concerns, but also moral ones.

Yet whilst the results demonstrated a shared opinion that everyone has responsibility for the production of energy justice, they also indicate that government and industry are assumed to carry more. This was a consistent finding; NGO and policy respondents shared the view that certain industry and especially governmental actors held more influence over energy justice outcomes. Government actors included the Secretary of State, former Chancellor of the Exchequer George Osborne, and government bodies such as DECC, the ONR, the Department of Business, the Health Services Commissioner, and the

Nuclear Installations Inspectorate. Thus, the research findings illustrate that the question is not simply who is responsible for the provision of energy justice, but who has the highest *degree* of responsibility – calling into question the dispersed understandings of responsibility that currently populate energy justice literature.

Energy justice scholars (Heffron et al. 2016, Jenkins et al. 2016, McCauley et al. 2013, Sovacool and Dworkin 2015) have consistently argued that “we all” have a responsibility to ensure that energy justice is achieved. Our findings suggest that this is possible, but only if “we all” feel empowered with a sense of understanding of who is responsible for what. Damgaard et al. (2017) revealed in their study of biofuels in Nepal that individuals adopted a greater sense of responsibility in producing and consuming energy when they understood how their biofuel energy system worked, and that they had to maintain that system. Our study goes further by suggesting that when parts of society (in this case NGOs) do not feel empowered with a sense of understanding, narrower centralised forms of responsibility emerge – focusing in this case on government.

Sovacool and Dworkin (2015: 440) recognise that we need to make energy decisions that promote responsibility, including attention to the minimisation of negative externalities or energy-related social and environmental costs. They continue that “this element of energy justice is perhaps the most controversial and complex, as it blends together four somewhat different notions of “responsibility”: a responsibility of governments to minimise environmental degradation; a responsibility of industrialised countries responsible for climate change to pay to fix the problem (the so-called “polluter pays principle”); a responsibility of current generations to protect

future ones; and a responsibility of humans to recognise the intrinsic value of non-human species, all of these adhering to a sort of “environmental ethic”. We identify that a shift in attention is required from different instances of responsibility to understanding the individuals and organisations that are attributed responsibility for them.

5.2 Transparency as key determinant of models of responsibility

The ultimate objective of a dispersed collective sense of responsibility, as in Young’s social connection model, assumes and requires transparency. In our study, the NGOs’ adoption of a largely centralised, narrow government-focused sense of responsibility contrasted with the policy elite approach which prioritised a more nuanced and dispersed, but minimal, view of responsibility. We identify transparency as critical to the adoption of these “models” by the actors in question. In line with Reese and Jacob (2015), a perceived lack of transparency drove a sense of moral anger among NGOs, resulting in our study in a disconnect with other actors such as business or regulators. On the other hand, government, business and regulators all felt empowered with a sense of knowing how the system worked – but they recognised that ultimately this could lead to a financial bottom-line approach.

Nonetheless, in discussing notions of responsibility, both sets of interviewees advanced the typical application of justice as recognition, which has focused on the recipients of benefits or ills only, rather than those who create them. The respondents also highlighted who is perceived to be responsible for remediating injustices, or conversely, ensuring the continuation of just practices. This supports the work of Heffron et al. (2015) who argue a central purpose of

energy justice is to identify how practitioners can critically evaluate the impacts of energy policies, and how best they can respond – thus attributing accountability. Simultaneously, however, it raises the questions of who the “practitioners” are, and also the central issue of transparency in defining which roles the practitioners do, and should, play.

6. Conclusions and policy implications

Our findings are taken to be illustrative and represent only an early exploration of responsibility discourses - an initial platform for development. Future research in this area would benefit from taking more discrete industry and policy stances. This would be possible given a longer research timespan and with stronger pre-existing research networks, both of which are especially important given that the UK nuclear sector is currently highly-studied and politically charged. We conclude, therefore, with some implications of this research for policy, and the potential for future similar investigations.

Although efforts to make energy policy participatory and more transparent through the planning processes are well established, there is a continued need to engage with ideas of energy justice within energy policy to overcome what Markowitz and Shari (2012) identify as a moral vacuum in energy decision-making. The emphasis is on a socially-oriented energy policy cognisant of the energy justice implications – both positive and negative – of the energy infrastructure we pursue, and ensuring that transparency is upheld throughout the policy process is critical. In the UK’s case, as well as for the other 31 countries currently utilising or pursuing nuclear technology (WNA 2016), this includes continued, detailed attention to the different perceptions of

responsibility raised by nuclear power, both in principle and in practice. Only with full transparency does it become clear who is responsible for what, and therefore how best to work towards just energy provision and decision-making. Policy frameworks that allocate and uphold responsibility are required.

We support Jenkins *et al.* (2017) in the need to reflect upon the source-specific implications of an energy form, as well as that energy form's role within the wider energy mix. Despite using a nuclear energy case to develop our arguments, we suggest that policy-oriented approaches to energy justice and responsibility are important for every energy source. In 2015 nuclear energy production in the UK provided 20.8% of total electricity generation (DECC 2016), with the remainder made up of a mix of gas, coal, oil and renewables. Thus the discourses presented here represent a small fraction of those raised by energy production, and do not capture the full range of justice issues associated with energy use. Each energy source (the justice nature of which is inevitably contested) is characterised by a different balance of benefits and negatives and involves a different mix of "responsible actors" depending, in part, on whether the energy form is centralised or decentralised. Thus, this paper is not only contributing to nuclear energy justice dialogues, but opens new avenues to explore responsibility for energy justice in the context of other energy forms and technologies.

We also acknowledge that there are difficulties associated with responsibility, as demonstrated in the climate and environmental justice movements. How should responsibility be mandated? Who governs and monitors it? Is it open to exploitation? Indeed, the suggestion that some groups hold a higher degree of responsibility may in itself generate conflict. For example

Stirling (2014) states that attributing responsibility may reduce collective capacities for open, progressive, plural and critical political discourse. We re-assert that wider society and other actor groups retain an important role in assessing just energy policy. Using the example of climate justice and emissions, Vanderheiden (2008) explains that citizens of democratic societies have responsibility for the (in)actions of their governments, where they must use their democratic means to fight ineffective policies. Policy must therefore continue to engage with public consultation and give support to marginalised actor groups.

Secondly, we caution that the expectation that transparency will always lead to dispersed collective senses of responsibility may not be valid. Heyd (2012) refers, for example, to the impossibility of what he calls “prospective justice”, whereby individuals or whole nations extend their concern for welfare and social position to all peoples. The breadth expected in cosmopolitan or collective models permits, necessarily, the diffusion of responsibility. In line with Martin and North (2015) we take this to mean that each person or group is less likely to take responsibility for an action or inaction. In the case of an issue of energy justice, when other people/groups are also involved actors may assume that others are either responsible for taking action, or have already done so. Kurosawa (1992) reminds us further that such processes of diffusion are to be more expected in some cultures (especially individualistic ones) than in others. As this is the study, we highlight the necessity of using policy tools oriented towards the regular reassessments of who is responsible, and of how successfully transparency is being achieved.

Nonetheless, despite the acknowledged difficulty of attributing responsibility, in order to fulfil environmental, economic *and* social criteria an energy justice perspective *is* required. This will complement the conventional focus of energy studies on the costs of certain energy choices and technologies.

Finally, as an addendum to the above discussion it is today apparent that the Hinkley Point C development is not going as well as the government would have wished. EPR design faults discovered at Flamanville, France, together with major cost and time over-runs both in France and at the EPR facility at Olkiluoto, Finland, exist as warnings of possible project failures in the UK. The proposed cost of electricity from Hinkley Point C (£92.50 per MWh), the virtual collapse of Areva, and the resignations of key EDF personnel have reinforced concerns. Serious political reservations about the involvement of Chinese companies as key providers of a new generation of nuclear plants at Bradwell B and Sizewell C compound the disquiet.

It is tempting to infer that those who felt “empowered” by knowledge of how the system works, and who also therefore assumed “narrower centralised forms of responsibility”, have unconsciously been blind to the deteriorating state of affairs on the project. However, this speculation is not supported by the data or our results, and further study would be required to determine whether the inference is valid. Notwithstanding, we can say that Hinkley Point C is a pertinent example of failure to attend fully to the fundamental principles of energy justice, and the enactment of it. Whether, and how far, this divergence can be recovered for Hinkley Point C and the other proposed nuclear energy developments in the UK is likely to remain an open question for a considerable time to come. We hope that this study helps to close the gap.

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Appendix 1: List of Organisations

Department of Energy and Climate Change
 Energy Company 1
 Energy Company 2
 Friends of the Earth
 No2 Nuclear Power
 Open University
 Sedgemoor District Council
 Smarter Grid Solutions
 Stop Hinkley
 South West Against Nuclear
 Wilkinson Environmental Consulting Ltd
 UNITE
 University of Greenwich